

**SONY®**

BATTERY CHARGER

**BC-L120**

MAINTENANCE MANUAL

1st Edition

## 警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、人身事故につながる可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

## **WARNING**

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

## **WARNUNG**

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

## **AVERTISSEMENT**

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

# Table of Contents

## Manual Structure

|                              |       |
|------------------------------|-------|
| Purpose of this manual ..... | 3 (E) |
| Related manuals .....        | 3 (E) |
| Contents .....               | 3 (E) |

## 1. Service Overview

|   |         |
|---|---------|
| 1-1. Power Voltage .....                          | 1-1 (E) |
| 1-2. Recommended Power Cord .....                 | 1-1 (E) |
| 1-2-1. Connecting Connector and Cable .....       | 1-1 (E) |
| 1-2-2. Input/Output Signal of the Connector ..... | 1-1 (E) |
| 1-3. Circuit Board Location .....                 | 1-2 (E) |
| 1-4. Removing the Cabinets .....                  | 1-3 (E) |
| 1-4-1. Removing the Case (Bottom) .....           | 1-3 (E) |
| 1-4-2. Removing the Case (Top) .....              | 1-3 (E) |
| 1-5. Replacing the Fan .....                      | 1-4 (E) |
| 1-6. Removing the A Board .....                   | 1-4 (E) |
| 1-7. Replacing the Fuse .....                     | 1-5 (E) |
| 1-8. Notes on Repair Parts .....                  | 1-6 (E) |

## 2. Electrical Alignment

|  |         |
|--|---------|
| 2-1. Charging Current Adjustment ..... | 2-1 (E) |
|--|---------|

## 3. Spare Parts

|                                  |     |
|----------------------------------|-----|
| 3-1. Exploded View .....         | 3-2 |
| 3-2. Electrical Parts List ..... | 3-4 |

## 4. Board Layouts

|               |     |
|---------------|-----|
| A Board ..... | 4-1 |
| B Board ..... | 4-1 |
| C Board ..... | 4-2 |
| D Board ..... | 4-2 |
| E Board ..... | 4-2 |
| F Board ..... | 4-2 |
| G Board ..... | 4-2 |

## 5. Diagrams

|                          |     |
|--------------------------|-----|
| 5-1. Block Diagram ..... | 5-1 |
| 5-2. Frame Wiring .....  | 5-2 |

## Manual Structure

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### Purpose of this manual

This is the maintenance manual of the Battery Charger BC-L120.  
This manual is intended for use by service engineers and describes the information that premises maintenance of the unit and the service based on components replacement (removal of boards, electrical alignment, parts list, board layouts, block diagrams, frame diagrams).

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### Related manuals

Beside this Maintenance Manual, the following manuals are available for the unit.

- **Operation Manual (Supplied with BC-L120)**

This manual describes how to operate the BC-L120.

- **“Semiconductor Pin Assignments” CD-ROM (Available on request)**

This “Semiconductor Pin Assignments” CD-ROM allows you to search for semiconductors used in Communication System Solutions Network Company equipment.

Semiconductors that cannot be searched for on this CD-ROM are listed in the maintenance manual for the corresponding unit. The maintenance manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.

Part number: 9-968-546-XX

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### Contents

The following is a summary of all the sections for understanding the contents of this manual.

#### **Section 1 Service Overview**

Describes the power supply voltage, recommended power supply cord, board layouts and procedure how to replace the parts.

#### **Section 2 Electrical Alignment**

Describes the charge voltage adjustment.

#### **Section 3 Spare Parts**

Describes the exploded views and parts list.

#### **Section 4 Board Layouts**

Describes the board layouts for mounted circuit boards.

#### **Section 5 Diagrams**

Describes the overall block diagram and frame diagram.



# Section 1

## Service Overview

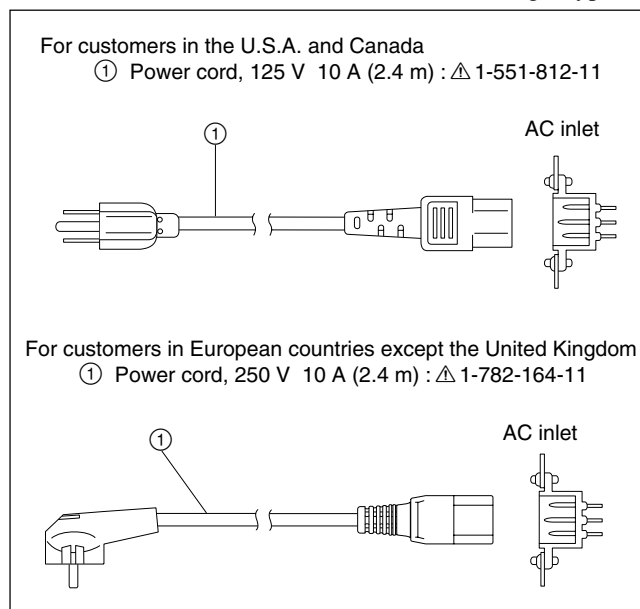
### 1-1. Power Voltage

120 V AC, 60 Hz

### 1-2. Recommended Power Cord

The following power cords are available separately for this unit. Use the power cord that is applicable to the places in the world.

SONY POWER CORD (2.4 m) DK-2401 (Straight type)



### 1-2-1. Connecting Connector and Cable

To connect the cable to the DC OUT connector (XLR, 4 pin), use the specified connecting cable and connector.

#### Connecting connector

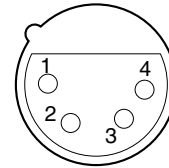
XLR 4-pin, Female : 1-508-362-11

#### Connecting cable

CCDD-X2 (2 m, option)

### 1-2-2. Input/Output Signal of the Connector

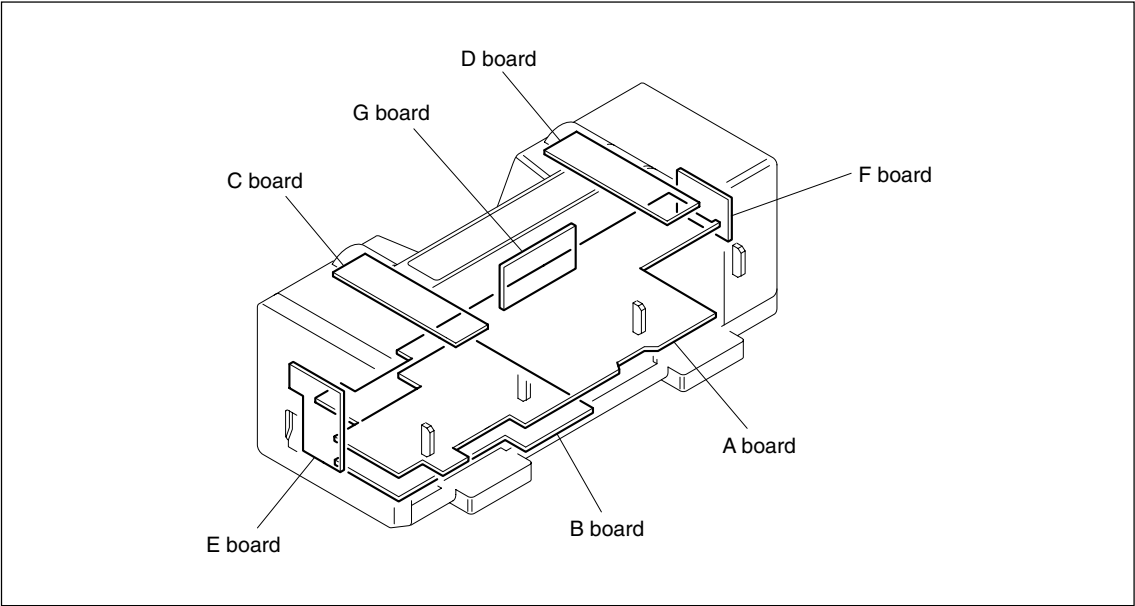
DC OUT (4-pin male)



— EXT VIEW —

| Pin No. | Signal | Specifications            |
|---------|--------|---------------------------|
| 1       | GND    | GND for UNREG             |
| 2       | NC     | No Connection             |
| 3       | NC     | No Connection             |
| 4       | DC OUT | +16.8 to +17.0 V, 6 A MAX |

1-3. Circuit Board Location

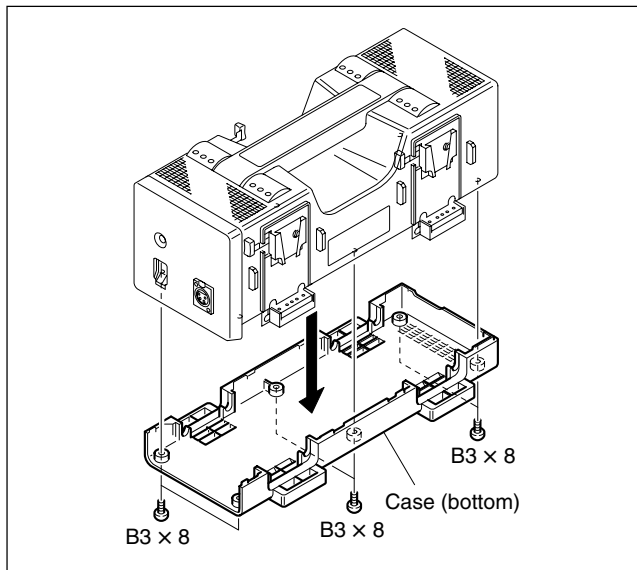




## 1-4. Removing the Cabinets

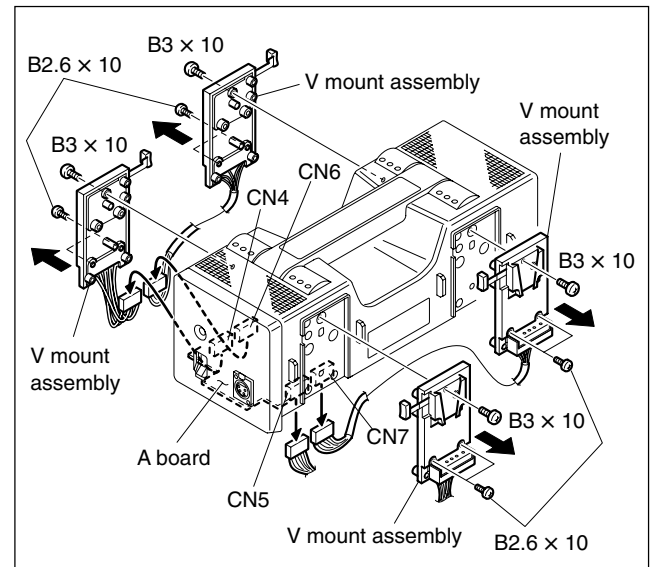
### 1-4-1. Removing the Case (Bottom)

Remove the six screws and remove the case (bottom) in the direction of the arrow.

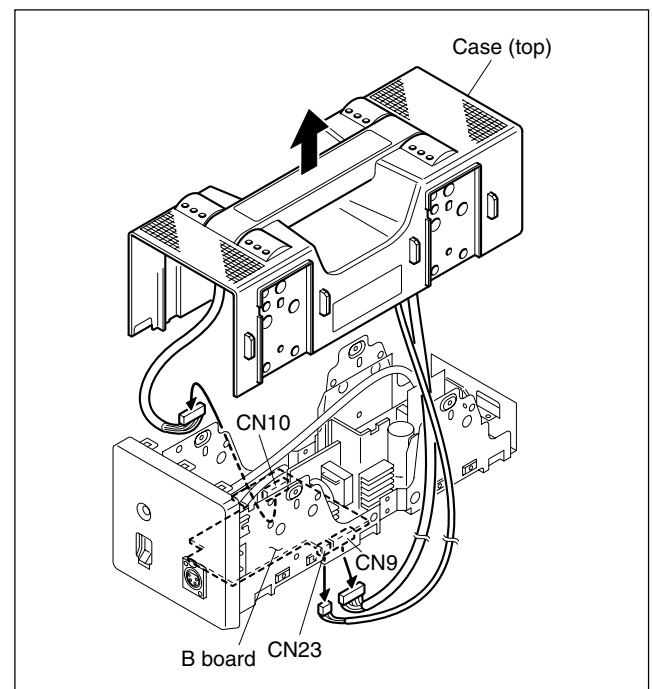


### 1-4-2. Removing the Case (Top)

1. Remove the case (bottom). (Refer to Section 1-4-1.)
2. Remove the connectors (CN4, CN5, CN6, CN7) on the A board.
3. Remove the four screws (B3 x 10) and eight screws (B2.6 x 10), then remove the four V mount assemblies.



4. Remove the connectors (CN9, CN10, CN23) on the B board and remove the case (top) in the direction of the arrow.

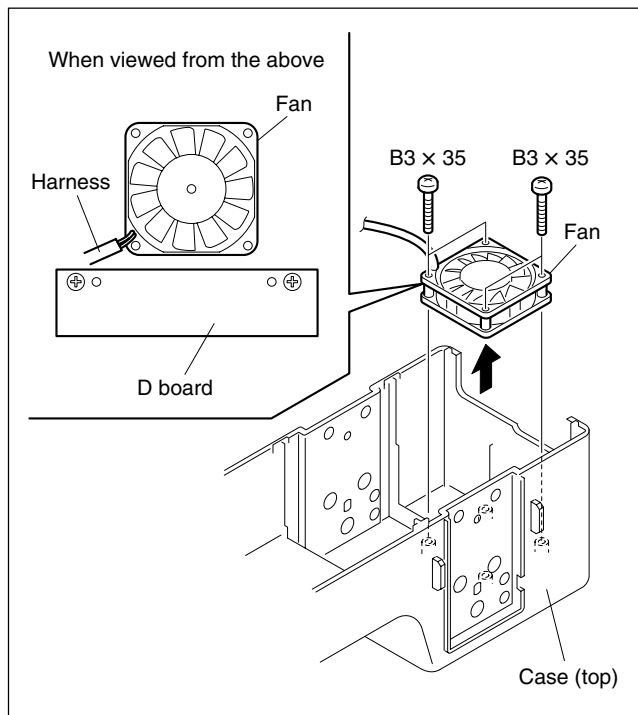


## 1-5. Replacing the Fan

The fan used in the unit is the periodic replacement part.  
To replace the fan, purchase the following specified fan.

Recommended replacement period : Every five years  
Parts No. : 9-885-010-21

1. Remove the cases (bottom and top). (Refer to Section 1-4.)
2. Turn over the case (top). Remove the four screws then remove the fan.



3. Attach a new fan in reverse order of the disassembling procedure.

### Note

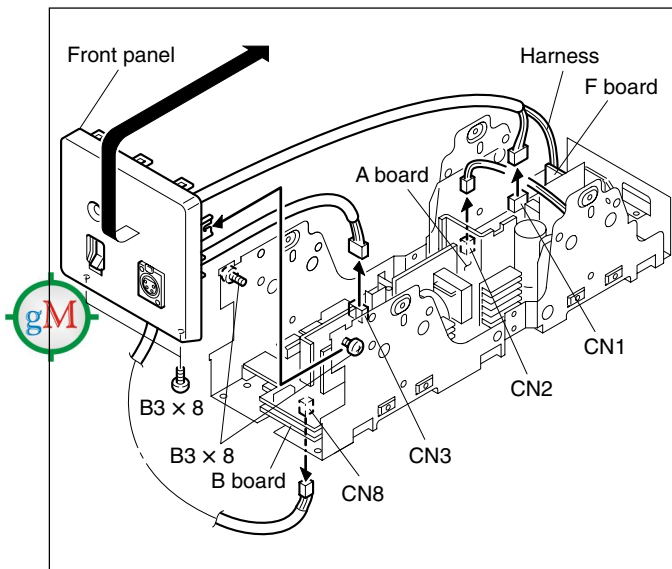
Attach a new fan facing it as shown in the figure.

## 1-6. Removing the A Board

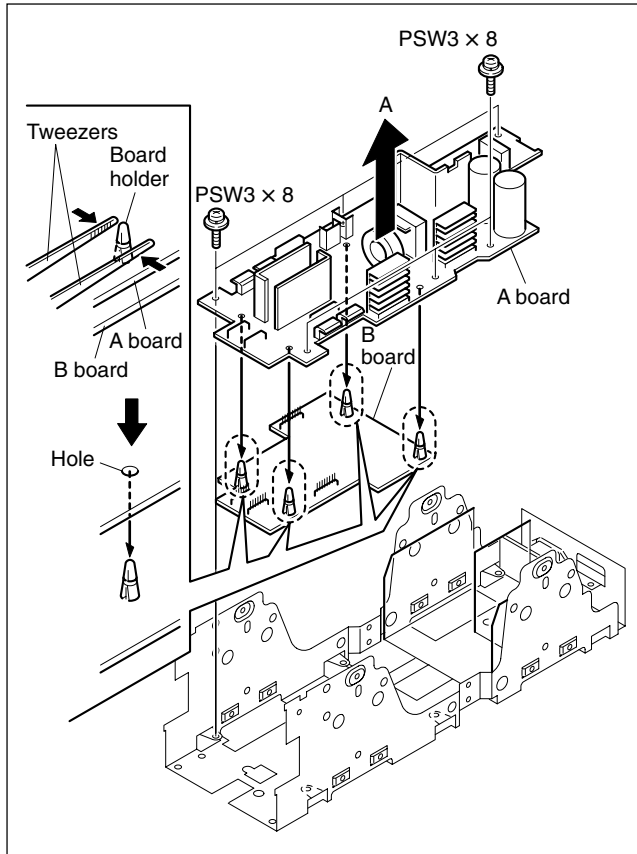
1. Remove the cases (bottom and top). (Refer to Section 1-4.)
2. Remove the connectors (CN1, CN2, CN3) on the A board.
3. Remove the connector (CN8) of the B board.
4. Remove the two screws on the bottom side of the front panel.
5. Loosen the right and left two screws and remove the front panel in the direction of the arrow.

### Note

The front panel cannot be removed completely because the harness of the front panel is fixed to the F board by soldering.



6. Remove the six screws and remove the A board assembly in the direction of arrow A.
7. Pinch the tip of the four holders by tweezers, pull out the holders from the holes, then remove the B board from the A board.



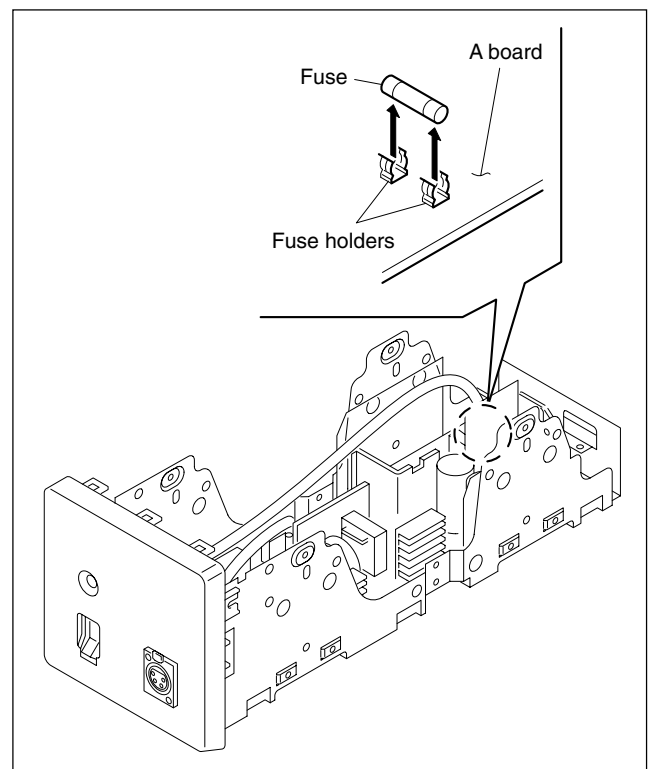
## 1-7. Replacing the Fuse

### **WARNING**

The fuse is significant for safety. When replacing the fuse, be sure to use the specified one.

Parts No. : 9-885-010-13

1. Remove the cases (bottom and top). (Refer to Section 1-4.)
2. Remove the fuse from the two fuse holders on the A board in the direction of the arrow.
3. Attach a new fuse to the fuse holder.



## 1-8. Notes on Repair Parts

### 1. Safety Related Components Warning

#### **WARNING**

Components marked  $\triangle$  are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

### 2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.  
Parts list has the present standardized repair parts.

### 3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

### 4. Harness

Harnesses with no part number are not registered as spare parts.  
In need of repair, get components shown in the list and repair using them.

## Section 2

### Electrical Alignment

#### 2-1. Charging Current Adjustment

Equipment : DC voltmeter, DC ammeter, Constant voltage load

Test point : CN4-5, 6, 7 (GND : CN4-1, 2, 3)/  
A board

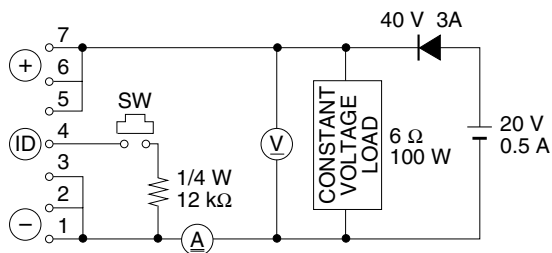
Adjustment point : ●VR1/HIC 1 (Hybrid IC)

Specification :  $3.0 \pm 0.15$  A

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#### Adjustment Procedure

1. Connect the variable load unit between CN4-5, 6, 7 and CN4-1, 2, 3 as shown in the following figure.  
Connect the resistor, ID between CN4-4 and CN4-1.
2. Adjust the constant voltage load so that the DC voltage of the variable load unit is  $15.0 \pm 0.05$  V.
3. Turn on the power.
4. Set “SW” to ON. Connect the resistor, ID. Adjust ●VR1 so that the DC current of the variable load unit is  $3.0 \pm 0.15$  A.



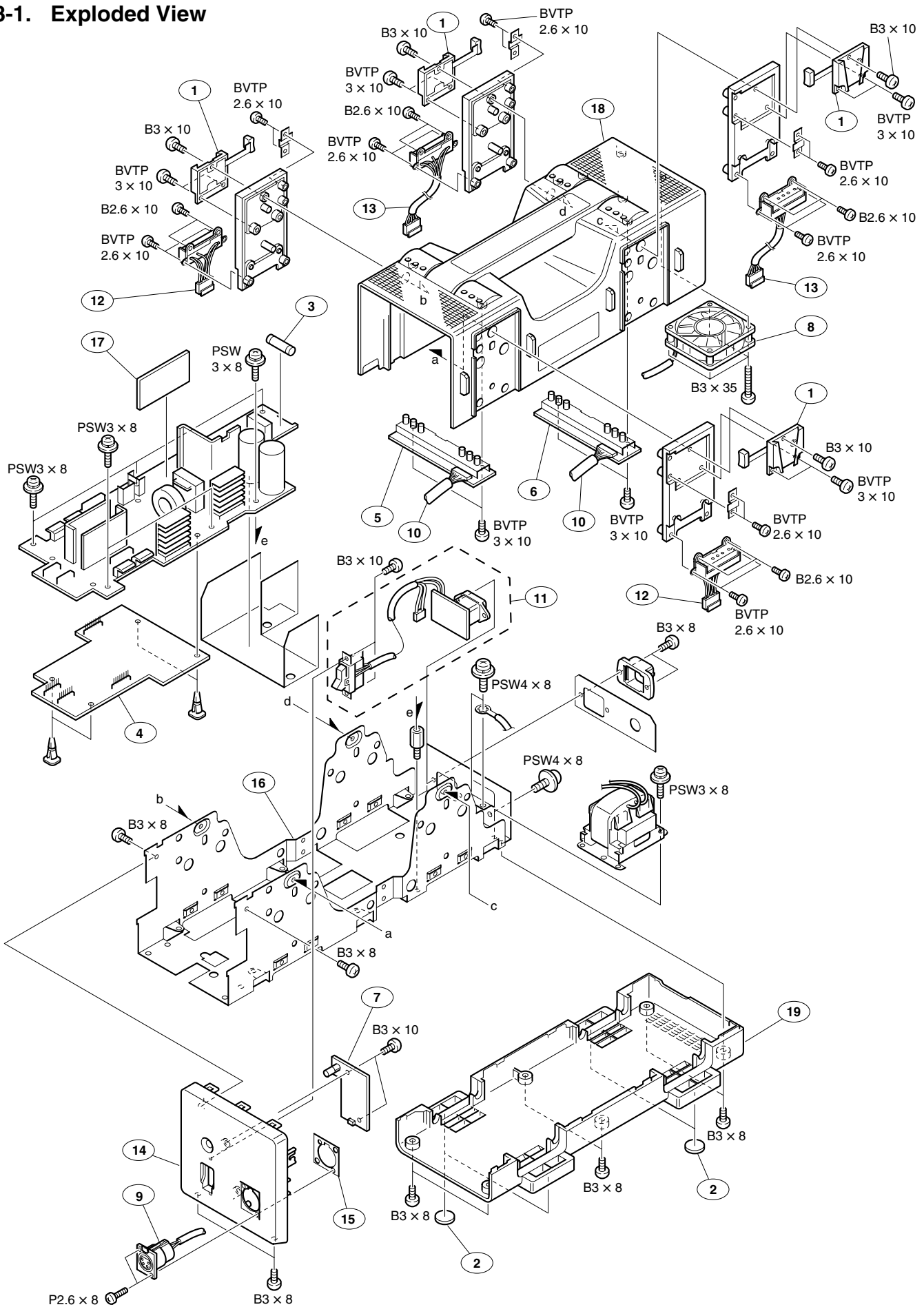


## **Section 3**

### **Spare Parts**

## Exploded View

### 3-1. Exploded View





| No. | Part No.       | SP | Description              |
|-----|----------------|----|--------------------------|
| 1   | A-8279-000-A   | s  | MOUNT (B), V ASSY        |
| 2   | 2-990-911-01   | s  | FOOT, RUBBER             |
| 3   | △ 9-885-010-13 | s  | FUSE                     |
| 4   | 9-885-010-17   | o  | MOUNTED CIRCUIT BOARD, B |
| 5   | 9-885-010-18   | o  | MOUNTED CIRCUIT BOARD, C |
| 6   | 9-885-010-19   | o  | MOUNTED CIRCUIT BOARD, D |
| 7   | 9-885-010-20   | o  | MOUNTED CIRCUIT BOARD, E |
| 8   | 9-885-010-21   | o  | FAN                      |
| 9   | 9-885-010-22   | o  | HARNESS ASSY, XLR        |
| 10  | 9-885-010-23   | o  | HARNESS ASSY, LED        |
| 11  | △ 9-885-010-24 | o  | AC INLET ASSY (W/PW SW)  |
| 12  | 9-885-010-25   | o  | HARNESS 5P 1             |
| 13  | 9-885-010-26   | o  | HARNESS 5P 2             |
| 14  | 9-885-010-27   | o  | PANEL, FRONT             |
| 15  | 9-885-010-28   | o  | METAL, FITTINGS          |
| 16  | 9-885-010-29   | o  | CHASSIS                  |
| 17  | 9-885-011-06   | o  | MOUNTED CIRCUIT BOARD, G |
| 18  | 9-907-891-01   | o  | CASE, UPPER              |
| 19  | 9-907-892-01   | o  | CASE, LOWER              |

### Hardware List

| No. | Part No.     | SP | Description       |
|-----|--------------|----|-------------------|
|     | 7-621-259-52 | s  | SCREW +P2.6X8     |
|     | 7-621-775-50 | s  | SCREW +B2.6X10    |
|     | 7-682-548-09 | s  | SCREW +B3X8       |
|     | 7-682-549-09 | s  | SCREW +B3X10      |
|     | 7-682-948-01 | s  | SCREW +PSW3X8     |
|     | 7-682-961-01 | s  | SCREW +PSW4X8     |
|     | 7-685-535-19 | s  | SCREW +BVTP2.6X10 |
|     | 7-685-547-19 | s  | SCREW +BVTP3X10   |

## 3-2. Electrical Parts List

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A BOARD  
-----

| Ref.No.<br>or Q'ty | Part No.       | SP | Description               |
|--------------------|----------------|----|---------------------------|
| C1                 | △ 9-885-009-99 | s  | CAPACITOR, FILM 0.22 uF   |
| C2                 | △ 9-885-009-99 | s  | CAPACITOR, FILM 0.22 uF   |
| C3                 | △ 9-885-009-99 | s  | CAPACITOR, FILM 0.22 uF   |
| C4                 | △ 9-885-010-00 | s  | CAPACITOR, CERAMIC 0.1 uF |
| C5                 | △ 9-885-010-01 | s  | CAPACITOR, CERAMIC 47 pF  |
| C6                 | △ 9-885-010-02 | s  | CAPACITOR, 47 uF          |
| C7                 | △ 9-885-010-03 | s  | CAPACITOR, 1 uF           |
| C8                 | 9-885-010-04   | s  | CAPACITOR, 560 uF         |
| C9                 | 9-885-010-04   | s  | CAPACITOR, 560 uF         |
| C13                | 9-885-010-05   | s  | CAPACITOR, 220 uF         |
| C15                | △ 9-885-010-06 | s  | CAPACITOR, CERAMIC 2.2 nF |
| C16                | △ 9-885-010-06 | s  | CAPACITOR, CERAMIC 2.2 nF |
| C17                | △ 9-885-010-07 | s  | CAPACITOR, CERAMIC 1 nF   |
| C18                | △ 9-885-010-07 | s  | CAPACITOR, CERAMIC 1 nF   |
| C23                | 9-885-010-08   | s  | CAPACITOR, 470 uF         |
| C24                | 9-885-010-09   | s  | CAPACITOR, 220 uF         |
| C25                | 9-885-010-08   | s  | CAPACITOR, 470 uF         |
| C42                | 9-885-010-10   | s  | CAPACITOR, 220 uF         |
| C48                | 9-885-010-11   | s  | CAPACITOR, 100 uF         |
| D1                 | 9-885-009-89   | s  | DIODE 1A5-F               |
| D2                 | 9-885-009-90   | s  | DIODE RS605M              |
| D3                 | 9-885-009-91   | s  | DIODE 05NU42              |
| D5                 | 9-885-009-91   | s  | DIODE 05NU42              |
| D6                 | 9-885-009-92   | s  | DIODE MTZJ30B             |
| D7                 | 9-885-009-93   | s  | DIODE AG01Z               |
| D8                 | 9-885-009-89   | s  | DIODE 1A5-F               |
| D21                | 9-885-009-94   | s  | DIODE ESAD92M-02          |
| D22                | 9-885-009-93   | s  | DIODE AG01Z               |
| D23                | 9-885-009-95   | s  | DIODE D10SC4M             |
| D24                | 9-885-009-95   | s  | DIODE D10SC4M             |
| D25                | 9-885-009-95   | s  | DIODE D10SC4M             |
| D26                | 9-885-009-95   | s  | DIODE D10SC4M             |
| D27                | 9-885-009-93   | s  | DIODE AG01Z               |
| D28                | 9-885-009-95   | s  | DIODE D10SC4M             |
| F1                 | △ 9-885-010-13 | s  | FUSE                      |
| FH1                | 9-885-010-14   | s  | HOLDER, FUSE              |
| FH2                | 9-885-010-14   | s  | HOLDER, FUSE              |
| IC1                | 9-885-009-96   | s  | IC STR83145-LF501         |
| IC2                | 9-885-009-97   | s  | IC NJM78M12FA             |
| IC3                | 9-885-009-98   | s  | IC NJM78M05FA             |
| L2                 | △ 9-885-009-83 | s  | INDUCTOR                  |
| L3                 | △ 9-885-009-83 | s  | INDUCTOR                  |
| L4                 | △ 9-885-009-84 | s  | INDUCTOR (For SY)         |
| L4                 | △ 9-885-010-30 | s  | INDUCTOR (For J)          |
| Q1                 | 9-885-009-85   | s  | FET 2SK2852               |
| Q2                 | 9-885-009-86   | s  | TRANSISTOR 2SB1129ST      |
| Q3                 | 9-885-009-86   | s  | TRANSISTOR 2SB1129ST      |
| Q4                 | 9-885-009-86   | s  | TRANSISTOR 2SB1129ST      |
| Q5                 | 9-885-009-86   | s  | TRANSISTOR 2SB1129ST      |
| Q6                 | 9-885-009-87   | s  | FET 2SJ258                |
| Q7                 | 9-885-009-87   | s  | FET 2SJ258                |
| Q8                 | 9-885-009-87   | s  | FET 2SJ258                |
| Q9                 | 9-885-009-87   | s  | FET 2SJ258                |
| Q11                | 9-885-009-88   | s  | TRANSISTOR 2SB1129        |
| T1                 | △ 9-885-009-82 | s  | TRANSFORMER TO-5376       |

(A BOARD)

| Ref.No.<br>or Q'ty | Part No.       | SP | Description        |
|--------------------|----------------|----|--------------------|
| TF1                | △ 9-885-010-16 | s  | THERMAL FUSE       |
| TH1                | 9-885-010-15   | s  | THERMISTOR         |
| VR1                | 9-885-010-12   | s  | RESISTOR, VARIABLE |

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B BOARD  
-----

| Ref.No.<br>or Q'ty | Part No.     | SP Description             |
|--------------------|--------------|----------------------------|
| 1pc                | 9-885-010-17 | o MOUNTED CIRCUIT BOARD, B |

-----  
C BOARD  
-----

| Ref.No.<br>or Q'ty | Part No.     | SP Description             |
|--------------------|--------------|----------------------------|
| 1pc                | 9-885-010-18 | o MOUNTED CIRCUIT BOARD, C |
| LED211             | 9-905-474-01 | o LED GL5ED60              |
| LED212             | 9-905-474-01 | o LED GL5ED60              |
| LED213             | 9-905-474-01 | o LED GL5ED60              |
| LED221             | 9-905-474-01 | o LED GL5ED60              |
| LED222             | 9-905-474-01 | o LED GL5ED60              |
| LED223             | 9-905-474-01 | o LED GL5ED60              |

-----  
D BOARD  
-----

| Ref.No.<br>or Q'ty | Part No.     | SP Description             |
|--------------------|--------------|----------------------------|
| 1pc                | 9-885-010-19 | o MOUNTED CIRCUIT BOARD, D |
| LED231             | 9-905-474-01 | o LED GL5ED60              |
| LED232             | 9-905-474-01 | o LED GL5ED60              |
| LED233             | 9-905-474-01 | o LED GL5ED60              |
| LED241             | 9-905-474-01 | o LED GL5ED60              |
| LED242             | 9-905-474-01 | o LED GL5ED60              |
| LED243             | 9-905-474-01 | o LED GL5ED60              |

-----  
E BOARD  
-----

| Ref.No.<br>or Q'ty | Part No.     | SP Description             |
|--------------------|--------------|----------------------------|
| 1pc                | 9-885-010-20 | o MOUNTED CIRCUIT BOARD, E |
| LED301             | 9-905-474-01 | o LED GL5ED60              |

-----  
F BOARD  
-----

| Ref.No.<br>or Q'ty | Part No.       | SP Description            |
|--------------------|----------------|---------------------------|
| 1pc                | △ 9-885-010-24 | o AC INLET ASSY (W/PW SW) |

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G BOARD  
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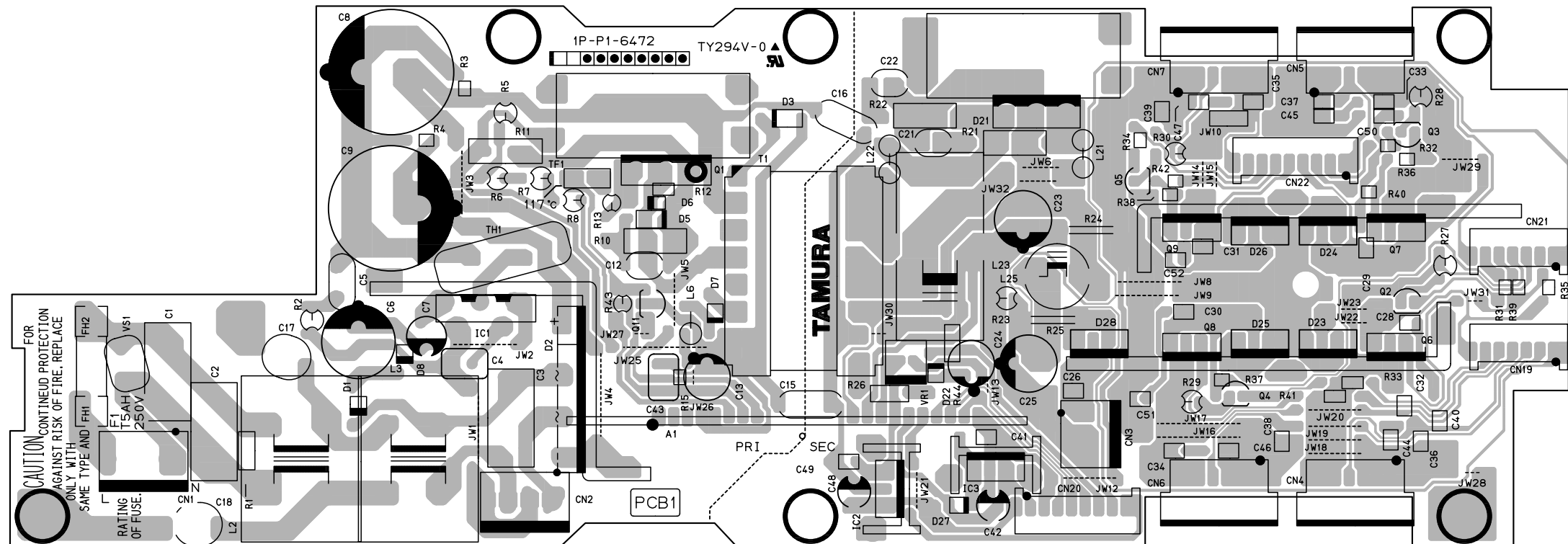
| Ref.No.<br>or Q'ty | Part No.     | SP Description             |
|--------------------|--------------|----------------------------|
| 1pc                | 9-885-011-06 | o MOUNTED CIRCUIT BOARD, G |

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FRAME  
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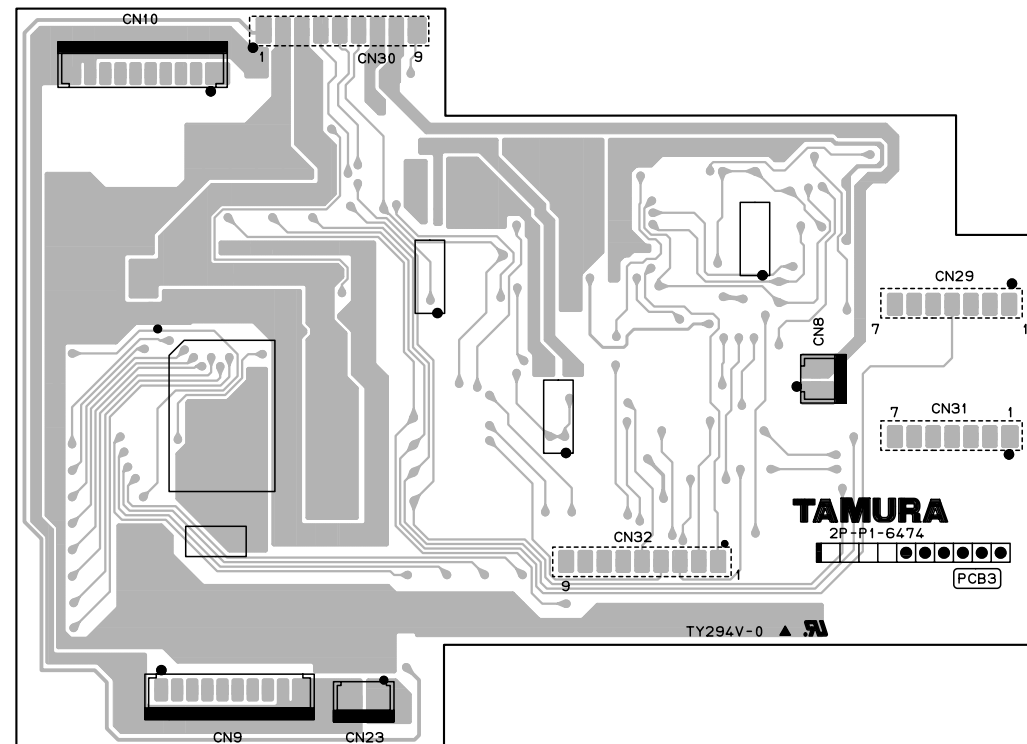
| Ref.No.<br>or Q'ty | Part No.     | SP Description   |
|--------------------|--------------|--|
| FAN101             | 9-885-010-21 | o FAN FBA06A12L  |
| HN101              | 9-885-010-22 | o HARNESS ASSY, XLR<br>(CN3/A board to EXTERNAL CONNECTOR) |
| HN102              | 9-885-010-25 | o HARNESS 5P 1<br>(CN4/A board)                            |
| HN103              | 9-885-010-25 | o HARNESS 5P 1<br>(CN5/A board)                            |
| HN104              | 9-885-010-26 | o HARNESS 5P 2<br>(CN6/A board)                            |
| HN105              | 9-885-010-26 | o HARNESS 5P 2<br>(CN7/A board)                            |
| HN106              | 9-885-010-23 | o HARNESS ASSY, LED<br>(CN9/B board to CN201/C board)      |
| HN107              | 9-885-010-23 | o HARNESS ASSY, LED<br>(CN10/B board to CN202/D board)     |



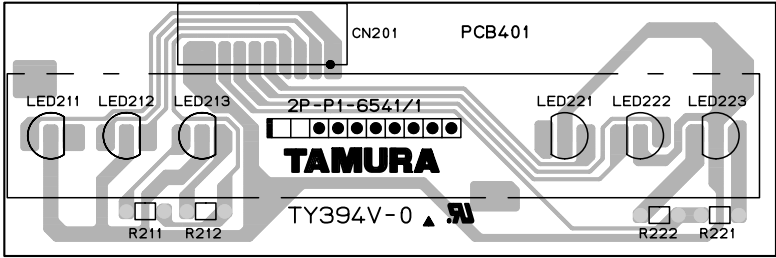
## Section 4 Board Layouts



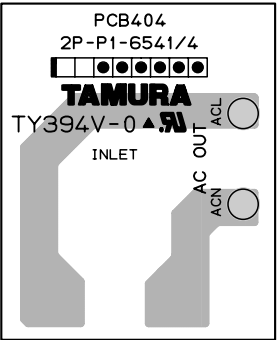
**A Board**  
-COMPONENT SIDE-



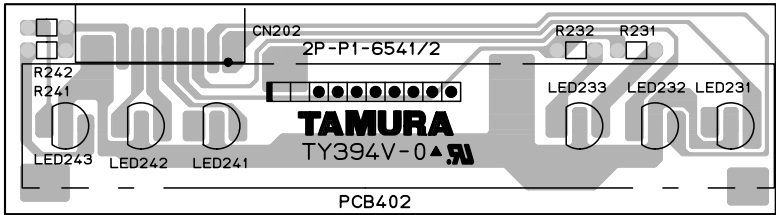
**B Board**  
-COMPONENT SIDE-



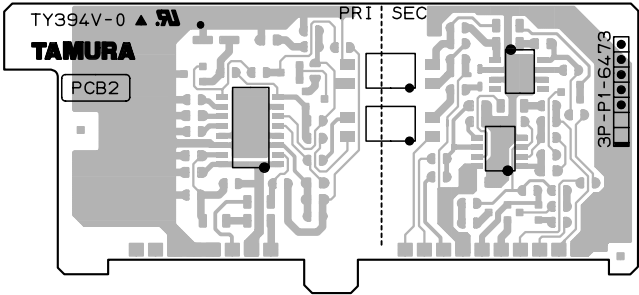
**C Board**  
-COMPONENT SIDE-



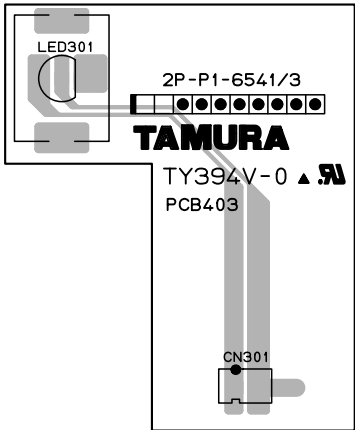
**F Board**  
-COMPONENT SIDE-



**D Board**  
-COMPONENT SIDE-



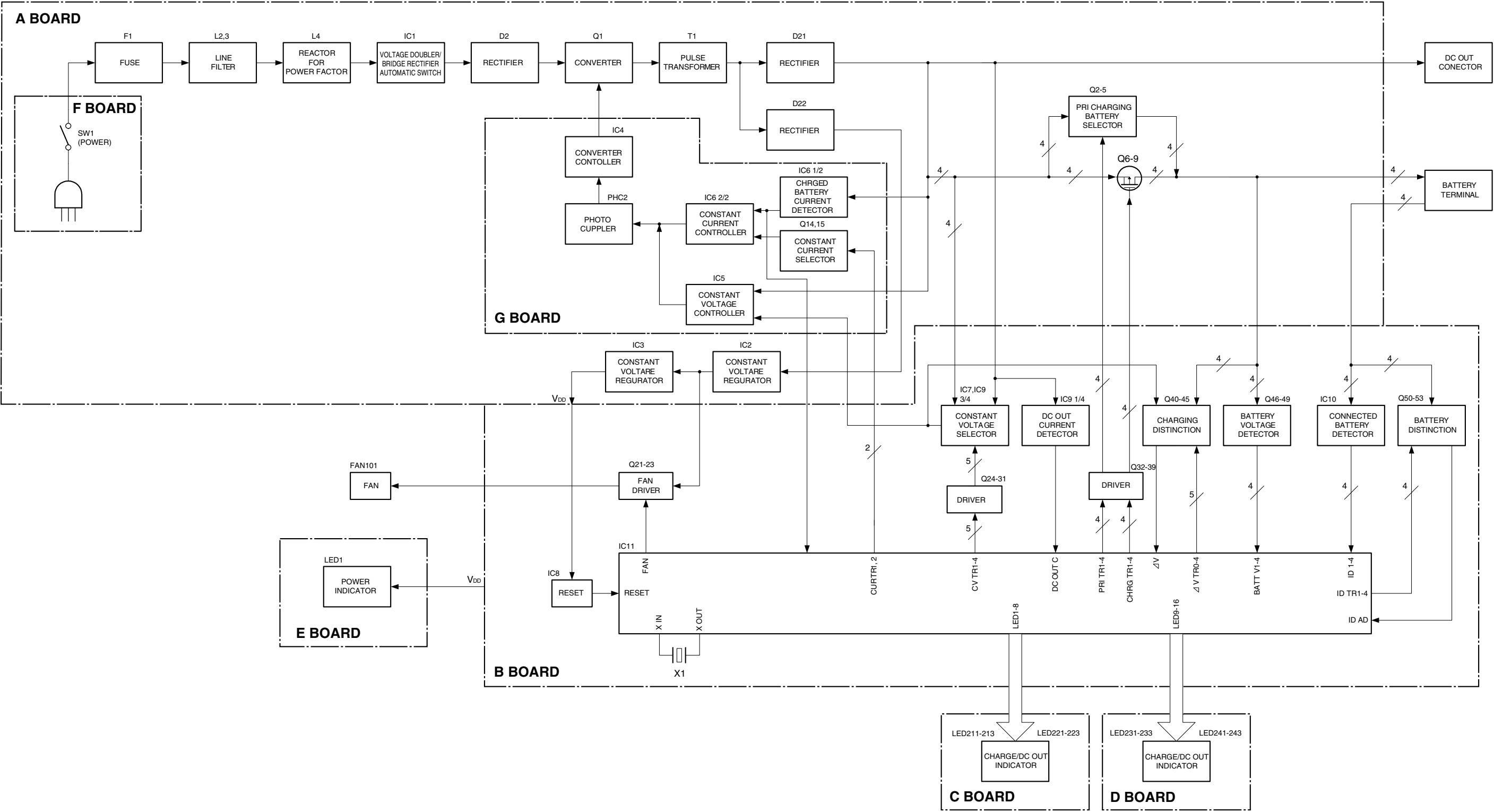
**G Board**  
-COMPONENT SIDE-



**E Board**  
-COMPONENT SIDE-

Section 5  
Diagrams

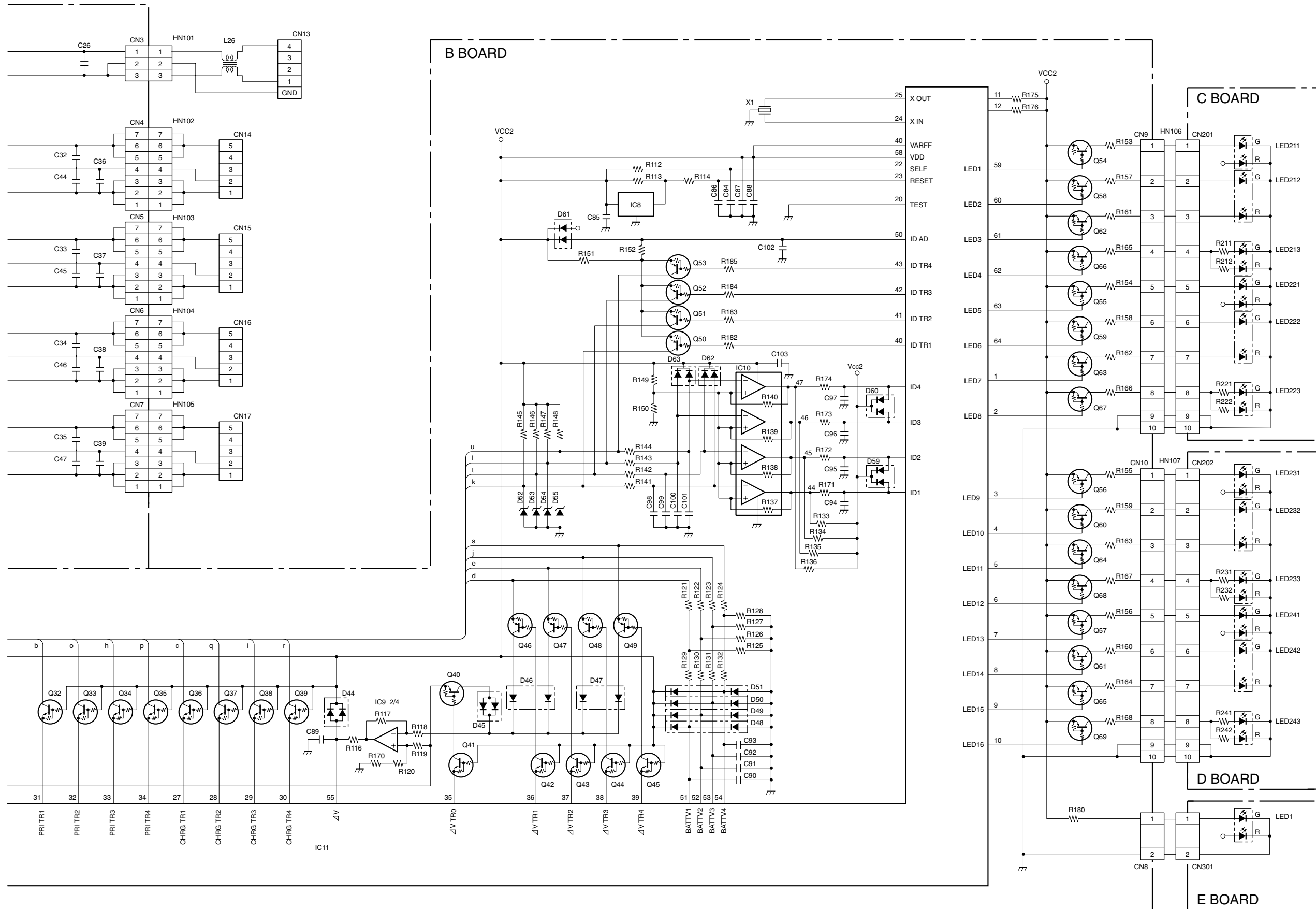
5-1. Block Diagram



Overall









## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

